

CASE STUDY: QUEENSLAND NICKEL AND COBALT REFINERY



Positive pressure respiratory protection made simple.

Queensland Nickel illustrates the challenges large industrial sites have when protecting their staff from hazardous airborne contaminants in the workplace. Based in the north-east of Australia, the refinery employs 1,000 people and is a global leader in the production of high quality nickel and cobalt.

The nickel and cobalt-bearing laterite ores are dried, ground, roasted and leached before being separated for sale to a global market. Despite system controls in place, the extraction process generates rogue nickel dust emissions of soluble and insoluble nickel forms with differing exposure standards requiring controls around personal respiratory protection.



Following an internal safety review, the Queensland Nickel's occupational hygienist examined a broad range of respiratory options with a focus on high levels of protection. Trials included passive P3 half masks through to Powered Air Purifying Respirators, including loose and tight-fitting headtops.

THE REQUIREMENTS

Due to demanding requirements, the challenge at the Queensland Nickel's site was maintaining compliance and productivity for staff wearing personal protective equipment (PPE).

- **Long periods of wear and flexibility:** Operators and maintenance staff needed protection for 6 hours (some up to 8 hours) on a daily basis wearing RPE. Meanwhile, managers and engineers only required RPE for short periods of time, but needed the ease of simple donning/doffing as they moved through the contaminated areas on site.
- **Mobility and high exertion tasks:** The plant covered an area the size of a football field and was 6 storeys high. The physical layout and the vast network of kilns, conveyors and elevators needing routine checks, adjustments and sampling meant operators were highly active and required mobility around the equipment.
- **Extreme working temperatures:** Industrial rotating kilns contributed to temperatures in and around the plant of 45°C



THE CHALLENGE

Due to the demanding requirements, the challenge at Queensland Nickel's site was maintaining compliance and productivity for staff needing to wear personal respiratory protection.

Negative pressure masks found staff struggling with acute discomfort from over-tightened straps, and heat under the mask when worn for several hours. Many of the belt-mounted positive pressure systems proved too restrictive for normal day-to-day tasks and were too bulky to carry when operating machinery or temporarily moving in and out of contaminated areas.

THE RESULT

The powered nature of CleanSpace Respirators ensured the high level of protection Queensland Nickel's management were after and delivered fresh air to the wearer, thus reducing risks of heat stress and respirator fatigue.



"The staff reported good battery life, comfort and easy transition from their traditional mask to the CleanSpace Technology. The built-in battery and compact neck mounted unit meant it was easy to carry around and clip on before entering controlled areas." explained Matthew Topp, QNI manager.

Over time, Queensland Nickel noted additional benefits in using the CleanSpace Respirator such as:

- Long filter life and peak load filter alarm (which alerts the wearer when to change filters, ensuring the full life is achieved from each filter).
- Easy to clean, low maintenance and durable. Even with daily use and long wear, the CleanSpace kits remained in good condition.

Importantly, Queensland Nickel has seen consistent compliance in staff wearing CleanSpace Respirators. Matthew attributes this to the additional comfort of fresh air and on-demand air flow when staff have high exertion work or working in hot temperatures. The company's other sites with high dust loads and blocked half masks have now also adopted CleanSpace Respirators.

CLEANSPEC TECHNOLOGY – A REVOLUTION IN RESPIRATORY PROTECTION